

REMARKS

Regarding the status of the present application, Claims 1-18 have been amended and are pending in this application. Reconsideration of this application is respectfully requested. A Petition and fee for a two month extension of time is enclosed.

The abstract of the disclosure was objected to by the Examiner. The abstract has been amended to address the Examiner's issue regarding "sampled in threads".

With regard to the Examiner's issue regarding "interval of the bursts of data" in lines 3-4, it is respectfully submitted that this correction is inappropriate. It is stated in the specification at page 19 lines 9-10 that "The fixed time intervals are slightly longer than the time interval of the bursts of data." It is respectfully submitted that this is substantially what is stated in the abstract and does not require amendment.

The Examiner suggested that in lines 4-5, "mixed with symbols of the divided data stream that have a fixed time separation" apparently should be "mixed with symbols of the divided data stream, next to symbols that have a fixed time separation". It is respectfully submitted that this correction is inappropriate. It is stated in the specification at page 19 lines 11-13 that "The sampling method 10 thus mixes a correction symbol with symbols of the divided data stream that have a fixed time separation." It is respectfully submitted that this is substantially what is stated in the abstract and does not require amendment.

In view of the above, withdrawal of the Examiner's objection is respectfully requested.

The disclosure was objected to because of various asserted informalities. The Examiner is thanked for the detailed review of the specification and drawings to uncover the errors. The specification has been amended to address the Examiner's issues. The specification has also been amended to correct minor grammatical errors found during review.

With regard to the Examiner's issue that "error "bursts" are treated as being synonymous with "random errors", which contradicts standard terminology in the art", it is stated in the specification that bursts are locations where the errors occur in groups, and several physical transmission media are cited where the errors tend to occur in bursts. In other words, the errors are randomly distributed, but the distribution function is not uniform. It is respectfully submitted that this is standard terminology for those skilled in the art of satellite communications.

On page 14: in line 9, the phrase "sampled in threads" has been changed to "sampled and placed into threads" and "bursts" has been changed to "noise bursts".

The Examiner stated that "On page 17: in line 7, "transmission stream 19" apparently should be "transmission stream 13". The specification refers to a "transmit output buffer 13" and to a "transmission stream 19". It is respectfully submitted that the specification is correct and does not need amending as to this issue.

On page 17, lines 16-17, "FIFO queue 14" has been changed to "FILO queue 14".

With regard to the Examiner's issue that "numerous references to Fig 4a showing a "device 10" appear to be inaccurate", it is respectfully submitted that the specification is correct.

Page 17, line three states that "Fig. 4a illustrates details of an exemplary threaded sampling error correction device 10 in accordance with the principles of the present invention." Furthermore, fig. 4a includes reference numeral 10 with an accompanying arrow at the right side of the figure.

The specification and drawings incorrectly referred to "method 10", which should be "method 20". The drawings and specification (page 19) have been amended to correct this.

It is respectfully submitted that the specification has been amended in a manner that addresses the Examiner's issues. In view of the above, withdrawal of the Examiner's objection is respectfully requested.

The drawings were objected to under 37 CFR 1.83(a). The Examiner indicated that "threads" must be shown in the drawing figures. The Examiner's objection under 37 CFR 1.83(a) is not understood, because Figs. 5 and 6 contain the term "threads", thus satisfying the 37 CFR 1.83(a) requirement of showing claimed features in the drawing figures.

The Examiner also objected to the drawings because "in Fig. 5, step 22, "IN THREADS" apparently should be "AND PLACED INTO THREADS". Fig. 5 has been amended to recite "AND PLACED INTO THREADS" as suggested by the Examiner. Enclosed is a marked up drawing showing proposed amendments marked in red ink. Also enclosed is a replacement reproducing master containing the amendments. In view of the above, withdrawal of the Examiner's objection is respectfully requested.

Claims 1-18 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner noted a number of issues relating to the Claims. The Examiner is thanked for his suggestions. Claims 1-18 have been amended to addresses the Examiner's issues. In view of these amendments, withdrawal of the Examiner's rejection of Claims 1-18 is respectfully requested.

Claims 1, 4-6 and 8 were rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 5,432,787 issued to Chethik.

The Examiner's position is that "Chethik discloses a coding arrangement for correcting errors in transmitted packets. Loading packets into a transmit packet buffer (34) involves "dividing a data stream into symbols" to be placed in respective buffer storage locations. When a packet is in position (42) within the buffer, it is "sampled" to a summing array (44-50) in a packet-sized "thread". Thus Chethik shows "sampling the divided data stream in threads, wherein samples are taken at fixed time intervals". A MUX (36) enables "inserting a correction symbol into the data stream to mix the correction symbol with data symbols that have a fixed time separation". Chethik's coding system is for "transmitting the data stream". At a receiver for the data encoded in Chethik's system, there is to provided the steps of "receiving the transmitted data stream", "performing error detection and correction computation on the data and error correction symbols" and "outputting the error corrected data"." It is respectfully submitted that the Examiner's position is in error.

It is not understood where in the Chethik patent the support for the rejection is found. For example, there is no specific recitation contained in the Chethik patent regarding "dividing a data stream into symbols", "sampling", "creating a "thread", or "sampling the divided data stream in threads, wherein samples are taken at fixed time intervals", "separation", as are recited in Claim 1. These terms and/or phrases are not found in the Chethik patent. Furthermore, there is no disclosure or suggestion in the Chethik patent regarding "inserting a correction symbol into the data stream to mix the correction symbol with data symbols, by inserting the correction symbol next to data symbols that have a fixed time separation", as are recited in amended Claim 1. It is respectfully submitted that the Examiner is reconstructing the present invention based upon the teachings of the Chethik patent taken in light of the teachings contained in the present application.

The Chethik patent discloses a packet communication system that uses a recovery method in which a "parity" packet is added to a transmitted packet string for each span (sequence) of K data packets. The parity packet's data field is comprised of the modulo-2 sum of the respective data bits of all of the K packets in the span.

It is stated in the Abstract of the Chethik patent, for example, that "The packet communication system transmits a stream of L data packets with at least one parity packet transmitted as an $L+1^{\text{th}}$ packet. The parity packet comprises at least N data segments, each i^{th} data segment being the modulo-2 sum of all identically positioned data segments in the stream of L packets. A node includes adaptive packet stream transmission apparatus which comprises a packet queue for holding a series of packets ready for transmission to a destination node. The adaptive packet stream transmission mechanism further includes modulo-2 sum circuitry for deriving a parity packet for each L transmitted data packets. Transmission control circuitry selectively enables transmission of a parity packet after each L data packets have been transmitted. A processor in the node controls the transmission control circuitry to vary the value of L in accordance with a determined network metric. The network metric may indicate a level of network congestion, with the processor increasing the value of L if the network metric manifests a lessened network congestion, and vice versa. The processor may vary the value of L in accordance with a data error rate metric."

The Chethik patent thus discloses the use of separate registers for each of N data segments. Each register has a computational length of L. The value of L varies as channel conditions vary. That is, there are N data registers, one for each data segment, and all have length L.

In contrast, and in terms of the language used in the Chethik patent, the present invention may have more than one register for each data segment, or, some data segments may have a different value for L than others. In other words, different data segments may have different levels of protection than others.

For instance, for transmission of Asynchronous Transfer Mode (ATM) cells, it has been recognized that it may be desirable to give more protection to the 5 octets of the header

than the 48 octets of the payload. The present invention allows: the header octets to have two registers each while adding in correction words alternately spaced $L/2$ apart. Thus, there would be 10 octets of the payload sharing 5 registers.

Thus, the Chethik patent provides uniform treatment of all data segments at a given time, but the level of protection can be varied depending upon channel conditions. The present invention allows differential treatment of different data segments.

There is no disclosure or suggestion in the Chethik patent regarding sampling a divided data stream and placing samples into threads, wherein samples are taken at fixed time intervals or inserting a correction symbol into the data stream to mix the correction symbol with data symbols, by inserting the correction symbol next to data symbols that have a fixed time separation.

With regard to Claim 1, it is respectfully submitted that it distinguishes over the teachings of the Chethik patent. In particular, amended Claim 1 calls for an error correction method for use with a noisy communication channel, said method comprising the steps of:

- dividing a data stream into symbols;
- sampling the divided data stream ~~in~~ and placing samples into threads, wherein samples are taken at fixed time intervals;
- inserting a correction symbol into the data stream to mix the correction symbol with data symbols, by inserting the correction symbol next to data symbols that have a fixed time separation;
- transmitting the data stream;
- receiving the transmitted data stream;
- performing error detection and correction computations on the data and error correction symbols; and
- outputting an error corrected data stream.

It is respectfully submitted that the Chethik patent does not explicitly disclose or suggest an error correction method that includes the steps of "sampling the divided data stream and placing samples into threads, wherein samples are taken at fixed time intervals", and "inserting a correction symbol into the data stream to mix the correction symbol with data symbols, by inserting the correction symbol next to data symbols that have a fixed time separation".

In view of the above, it is respectfully submitted that the inventions recited in Claim 1 is not disclosed or suggested by the Chethik patent. Withdrawal of the Examiner's rejection and allowance of Claim 1 are respectfully requested.

Dependent Claims 4-6 and 8 are considered patentable over the Chethik patent based upon their dependence from allowable Claim 1. Withdrawal of the Examiner's rejection and allowance of Claims 4-6 and 8 are respectfully requested.

Claims 1 and 3-8 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,546,474 to Sako et al. The Examiner's position is that "Sako discloses a coding arrangement for correcting errors in compact disk data. Applying words to a first interleaver/coder combination (1,8) involves "dividing a data stream into symbols". When a

word is in position to be applied to the first interleaver/coder combination, it is "sampled" by the interleaver/coder combination in a word-sized "thread". Thus Sako shows "sampling the divided data stream in threads, wherein samples are taken at fixed time intervals". Forming the final CIRC words involves "inserting a correction symbol into the data stream to mix the correction symbol with data symbols that have a fixed time separation". Sako's coding system is for "transmitting the data stream". At a decoder for the data encoded in Sako's system, there is to provided the steps of "receiving the transmitted data stream", "performing error detection and correction computation on the data and error correction symbols" and "outputting the error corrected data".

The Sako et al. patent discloses, in its Abstract, for example, a "method of receiving and decoding doubly-encoded, interleaved data occurring in blocks of information words and first and second check words to correct errors occurring due to transmission, includes adding error pointers to indicate uncorrectable errors, and thereafter checking the number of pointers in each block and protecting against miscorrection of errors. The data are decoded in a first decoder and the information words and first check words are corrected by syndromes using the second check words. A pointer is added to any words containing uncorrectable error. Then the words so decoded are deinterleaved and decoded in a second decoder, where the information words are corrected by syndromes using the first check words. Here the pointers show the position of any erroneous words to facilitate error correction. The number and location of erroneous words in each block, at the second decoder, is determined by using the error syndromes. If the erroneous word locations as determined by the syndromes is coincident with the locations indicated by the associated pointers, the erroneous words, up to the predetermined number, are corrected. Finally, uncorrected erroneous words are compensated by interpolation."

It is respectfully submitted that the teachings of the Sako et al. patent are thus similar to the teachings of the Chethik patent and provides uniform treatment of different data segments, but with a two pass error correction. It is respectfully submitted that the Sako et al. patent does not disclose or suggest differential treatment of different data segments.

More particularly, the Sako et al. patent teaches the use of a "cross-interleave technique" is used in conjunction with "an error correcting code high in error correcting ability." It is stated that "This error correcting code enables the simplification of the construction of a decoder when only one word error is to be corrected." [See the Description of the Prior Art section, first, third and fourth paragraphs]

This is not what is provided by the present invention. With specific regard to Claim 1, it is respectfully submitted that the Sako et al. patent does not explicitly disclose or suggest an error correction method that includes the steps of "sampling the divided data stream and placing samples into threads, wherein samples are taken at fixed time intervals", and "inserting a correction symbol into the data stream to mix the correction symbol with data symbols, by inserting the correction symbol next to data symbols that have a fixed time separation". The terms "thread", "placing samples into threads", "fixed time intervals", and "inserting the

correction symbol next to data symbols that have a fixed time separation" are not used in the Sako et al. patent.

It is also respectfully submitted that the Examiner is reconstructing the present invention based upon the teachings of the Sako et al. patent taken in light of the teachings contained in the present application.

In view of the above, it is respectfully submitted that the invention recited in Claim 1 is not disclosed or suggested by the Sako et al. patent. Withdrawal of the Examiner's rejection and allowance of Claim 1 are respectfully requested.

Dependent Claims 3-8 are considered patentable over the Chethik patent based upon their dependence from allowable Claim 1. Withdrawal of the Examiner's rejection and allowance of Claims 3-8 are respectfully requested.

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 5,432,787 issued to Chethik. It is respectfully submitted that Claim 2 is patentable over the Chethik patent based upon its dependence from allowable Claim 1. Therefore, withdrawal of the Examiner's rejection and allowance of Claim 2 are respectfully requested.

The Examiner indicated that Claims 10-18 were indicated as allowable if rewritten or amended to overcome the rejections under 35 U.S.C. § 112, second paragraph, set forth in the Office action. The finding of allowable subject matter in this application is appreciated. It is respectfully submitted that Claims 10-18 have been amended to be clear and definite and therefore meet the Examiner's indication of allowability. Allowance of Claims 10-18 is respectfully requested.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure to the extent indicated by the Examiner.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Reconsideration and allowance of this application are earnestly solicited.

Respectfully submitted,



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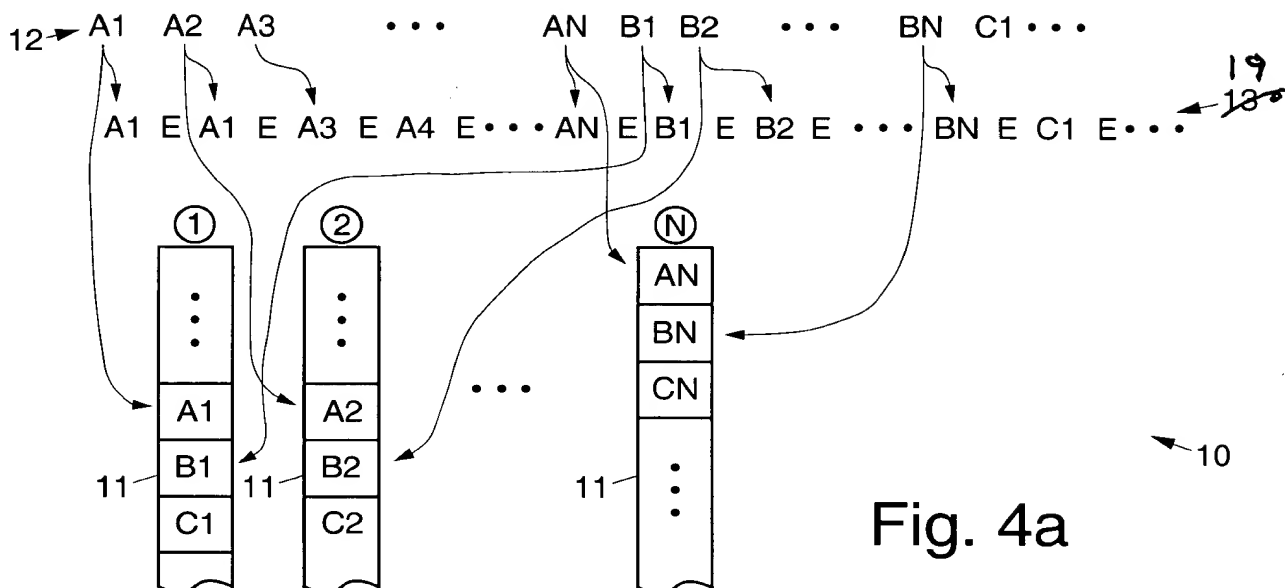
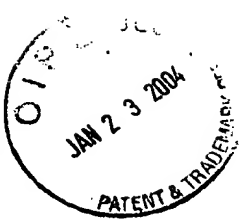
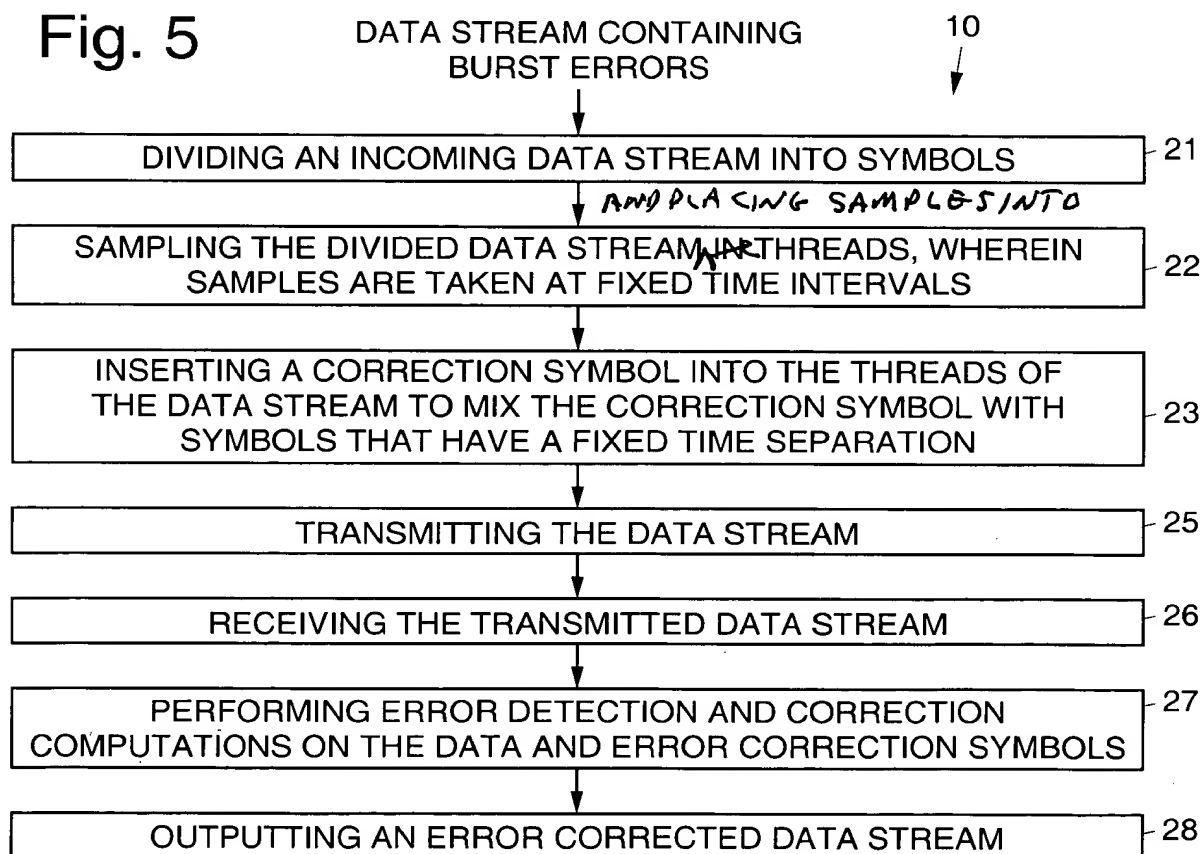


Fig. 4a

Fig. 5





AMGND50

4/4

Fig. 6

